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Some thoughts on the Turkish electricity distribution industry

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ABSTRACT

Over the past decade or so, the electricity industry of the Republic of Turkey (and indeed the world) has undergone profound reform in its structure, ownership and mindset. Increasing public concern about efficiency in the sector has led Turkey to discard the traditional model of a vertically integrated industry subject to cost-based regulation in favor of the unbundling of activities and the introduction of competition where it is possible. The industry has been structurally separated into generation, transmission, distribution and retail segments. The competitive segments of the industry (generation and retail) are planed to progressively expose to competition; the monopoly segments (especially, distribution) are to be reoriented to foster competition. Further, the ownership of the industry is under increasing pressure to move away from the public domain into the private one. The present article not only presents an analysis of the Turkish distribution sector and proposed privatization process but also provides some guidelines for policy makers.

Contents

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1. Introduction

Turkey's electricity distribution utility, TEDAS, and its distribution companies are Turkish state-owned joint-stock companies engaged in the distribution and retail sale of electricity and provision of retail services to final customers. With approximately 28 million customers, 93 billion kWh of electricity sales and 98% market share in electricity distribution across Turkey in 2005, TEDAS and its distribution companies together form one of the largest organizations in the country [1].

In the article, the evolution of Turkish electricity distribution industry is analyzed and then the decision about the privatization of Turkish electricity distribution regions is considered. The article is divided into four main sections. In Section 2 the reader is briefly familiarized with the Turkish economy and energy situation. Section 3 provides an impression of the Turkish electricity distribution business; including its evolution, recent market reforms, legal environment and ongoing privatization process. Section 4 elaborates on the question of "why should the distribution be privatized?" In Section 5, current policies are evaluated and some guidelines are introduced for policy makers to prevent some irreversible mistakes in market structure policy. Finally, a summary and some concluding remarks are provided in Section 6.

2. A summary of Turkish economy and energy situation

The Republic of Turkey, located in Southeastern Europe and Southwestern Asia (that portion of Turkey west of the Bosporus is geographically part of Europe), has an area of about 780,580 sq km and a population of over 70 million [2]. With its young population, growing energy demand per person, fast growing urbanization and economic development, Turkey has been one of the fast growing power markets of the world for the last two decades. Turkey is an energy importing country; more than half of the energy requirement has been supplied by imports.

Turkey's dynamic economy is a complex mix of modern industry and commerce along with a traditional agriculture sector that still accounts for more than 35% of employment. It has a strong and rapidly growing private sector, yet the state still plays a major role in basic industry, banking, transport, and communication. Real GNP growth has exceeded 6% in many years, but this strong expansion has been interrupted by sharp declines in output in 1994, 1999 and 2001 due to economic crisis. The economy is turning around with the implementation of economic reforms and 2004 GDP growth reached 9%, followed by roughly 5% annual growth from 2005 to 2006. Inflation fell to 7.7% in 2005, a 30-year low, but climbed back to 9.8% in 2006. Despite the strong economic gains from 2002 to 2006, which were largely due to renewed investor interest in emerging markets, IMF backing, and tighter fiscal policy, the economy is still burdened by a high current account deficit and high debt. Prior to 2005, foreign direct investment (FDI) in Turkey averaged less than $1 billion annually, but further economic and judicial reforms and prospective EU membership[2] are expected to boost FDI. Privatization sales are currently approaching $21 billion [2].

Turkey's population of more than 70 million is growing at an annual rate of 1.04% and expected to grow to 83.4 million in 2022. In response to the growth rates of population and consumption, Turkey's total final energy consumption (TFC) grew at an average annual rate of 9.6% over the last three decades. This average annual growth rate of TFC is projected to decrease to 5.4% between 2005 and 2010 and 7% between 2010 and 2020 [3]. Table 1 presents some important selected indicators for Turkey as of 2004 [2].

Table 1
Selected indicators for Turkey (2004)

Indicator	Value
Population (million)	71,158,647 (July 2007 est.)
Population growth rate	1.04% (2007 est.)
GDP (purchasing power parity)	$640.4 billion (2006 est.)
GDP (official exchange rate)	$361.1 billion (2006 est.)
GDP real growth rate	6.1% (2006 est.)
GDP per capita (PPP)	$9100 (2006 est.)
Electricity production	154.2 billion kWh (2005)
Electricity consumption	129 billion kWh (2005)
Electricity consumption/population (kWh/capita)	1766.00
CO_2 emissions[a] (Mt of CO_2)	209.45

[a] CO_2 emissions from fuel combustion only. Emissions are calculated using IEA's energy balances and the Revised 1996 IPCC Guidelines.

Turkey's primary energy sources include hydropower, geothermal, lignite, hard coal, oil, natural gas, wood, animal and plant wastes, solar and wind energy. In 2004, primary energy production and consumption has reached 24.1 million tonnes (Mt) of oil equivalent (Mtoe) and 81.9 Mtoe, respectively. Table 2 shows the Turkey's energy balance table in 2004. Fossil fuels provided about 86.9% of the total energy consumption of the year 2004, with oil (31.5%) in first place, followed by coal (27.3%) and natural gas (22.8%). Turkey has not utilized nuclear energy yet.[3] The Turkish coal sector, which includes hard coal as well as lignite, accounts for nearly one half of the country's total primary energy production (43.7%). The renewables collectively provided 13.2% of the primary energy, mostly in the form of combustible renewables and wastes (6.8%), hydropower (about 4.8%) and other renewable energy resources (approximately 1.6%) [4]

As can be seen in Table 2, the general equilibrium of energy use and supply indicators show that Turkey is dependent on import resources very heavily. In 2004, 77.6% of the total energy supply was met by imports, and the rest was domestically produced.

Turkey's total electricity production and installed capacity were 162.5 GWh[4] and 38.8 MW, respectively, in 2005 [5]. The distribution of the produced electricity energy according to primary energy sources was as follows: natural gas 44.74%, hydropower 25.11%, coal 25.05%, oil 4.92%, biomass 0.09%, geothermal 0.06% and wind 0.04% [6]. Table 3 reflects the increasing reliance on natural gas[5] in the power sector. The share of natural gas power plants in installed capacity was about 37% in 2005. Likewise, natural gas had the largest share in gross electricity output in 2005.

Recently, Turkey has initiated a major reform program of the regulatory framework surrounding the most important segments of her energy market; namely, electricity, natural gas, petroleum and liquefied petroleum gas industries. The reform program entails privatization, liberalization as well as a radical restructuring of the whole energy industry. Also, an autonomous regulatory body, Energy Market Regulatory Authority[6] (EMRA), was created to set up and maintain a financially strong, stable, transparent and competitive energy market.

The Turkish electricity industry is a large, high-growth sector in the Turkish economy. The industry contributes significantly to the

[2] In October 2005, accession negotiations are opened with Turkey, who has been an associate member of the EU since 1963 and an official candidate since 1999. For a more detailed discussion of EU-Turkey relations, see Erdogdu [12].

[3] For a more in depth discussion of nuclear energy in Turkey, see Erdogdu [13].

[4] The industrials customer group represents approximately 50% of the total demand, while residential customers consume slightly less than a quarter of the total. Commercials customer group, excluding public institutions, is placed third in terms of consumption with a 13% share.

[5] Turkey imports 96.9% of her natural gas consumption.

[6] The author himself is working for the EMRA.

Table 2
Energy balances for Turkey (2004)

Supply and consumption	Coal	Crude oil	Petroleum products	Gas	Nuclear	Hydro	Geothermal, solar, etc.	Combustibles renewables and waste	Electricity	Heat	Total[a]
Production	10531	2224	0	566	0	3963	1271	5557	0	0	24111
Imports	11200	23748	10481	18117	0	0	0	0	40	0	63587
Exports	0	0	−5289	0	0	0	0	0	−98	0	−5387
International Marine bunkers[b]	0	0	−1005	0	0	0	0	0	0	0	−1005
Stock changes	648	−183	115	20	0	0	0	0	0	0	599
TPES	22379	25789	4302	18704	0	3963	1271	5557	−59	0	81905
Transfers	0	0	0	0	0	0	0	0	0	0	0
Statistical differences	−64	191	0	0	0	0	0	0	0	0	126
Electricity plants	−8701	0	−764	−7964	0	−3963	−85	−21	12436	0	−9063
CHP plants	−75	0	−1131	−3028	0	0	0	−5	524	450	−3265
Heat plants	−532	0	0	0	0	0	0	0	0	0	−532
Gas works	0	0	0	0	0	0	0	0	0	0	0
Petroleum refineries	0	−26065	26534	0	0	0	0	0	0	0	469
Coal transformation	−1910	0	0	0	0	0	0	0	0	0	−1910
Liquefaction plants	0	0	0	0	0	0	0	0	0	0	0
Other transformation	0	85	−85	0	0	0	0	0	0	0	0
Own use	−302	0	−1706	−100	0	0	0	0	−615	0	−2724
Distribution losses	−27	0	0	−19	0	0	0	0	−1999	0	−2045
TFC	10766	0	27150	7594	0	0	1186	5530	10287	450	62962
Industry sector	8361	0	4460	2178	0	0	121	0	4992	0	20112
Transport sector	0	0	13079	105	0	0	0	0	63	0	13246
Other sectors	2405	0	5858	4881	0	0	1065	5530	5233	450	25420
Residential	2405	0	2879	3640	0	0	1065	5530	2375	0	17894
Commercial and public services	0	0	0	1240	0	0	0	0	2522	0	3763
Agriculture/forestry	0	0	2979	0	0	0	0	0	318	0	3297
Fishing	0	0	0	0	0	0	0	0	17	0	17
Non-specified	0	0	0	0	0	0	0	0	0	450	450
Non-energy use	0	0	3754	430	0	0	0	0	0	0	4184
of which petrochemical feedstocks	0	0	1406	430	0	0	0	0	0	0	1836

In thousand tonnes of oil equivalent (ktoe) on a net calorific value basis.
[a] Totals may not add up due to rounding.
[b] International marine bunkers are not subtracted out of the total primary energy supply for world totals.

country's GDP and is a USD 12 billion industry at current end-user prices. The sector's share in the Turkish economy has been growing rapidly, given the 8% per annum growth in electricity demand over the past two decades. This rate of demand growth has been higher than the growth rates seen in other major Turkish industries and outstrips growth in the Turkish economy overall.

Distribution losses of the system, which amounted to 19.8 billion kWh in 2004, are high compared to international benchmarks. Accordingly, one of the primary objectives of the electricity sector reform has been defined as reducing the loss/theft ratio to OECD levels.

Despite increasing demand, Turkey's per capita gross consumption is still very low at 2090 kWh compared to the EU average of 6460 kWh. According to the Ministry of Energy and Natural Resources (MENR) 2004–2020 projections that assume a continued cumulative annual growth rate of 7.7% in gross demand, per capita consumption is forecasted to reach 5700 kWh by 2020.

Table 3
Installed capacity and electricity generation in Turkey (2005)

Fuel type	Installed capacity (MW)	%	Electricity generation (GWh)	%
Natural gas	14199	36.58	72700	44.74
Hydropower	12906	33.25	40800	25.11
Coal	9117	23.49	40700	25.05
Oil	2527	6.51	8000	4.92
Biomass	28	0.07	150	0.09
Geothermal	23	0.06	90	0.06
Wind	20	0.05	60	0.04
Total	38820	100	162500	100

The forces that fuel growth in the sector are continued economic and industrial development, population growth and improving income levels. According to projections prepared by the national transmission company TEIAS on the growth of supply, there is sufficient generation capacity at least until year 2009. Required investments for more capacity are expected to be covered primarily by private sector investments [1].

3. An outline of Turkish electricity distribution industry

3.1. *Evolution of the Turkish electricity industry*[7]

This section of the paper provides a brief overview of the evolution of electricity industry in Turkey with a view to reveal the dynamics that have shaped current reform process in electricity distribution sector.

The Republic of Turkey was founded in 1923, and until the 1930s the electricity industry was heavily dependent on foreign investment as the country was trying a liberal economy. In the 1930s, there was a widespread belief all over the world in the benefits of public ownership of the electricity industry. Following this trend, nationalization of Turkish electricity industry started in

[7] Unless otherwise stated, this part is mainly based on the information included in Erdogdu [9].

1938 and, by 1944, almost all electricity industry had been placed within the public domain.

In the 1960s, the government started the ‘‘development plans era’’. The Ministry of Energy and Natural Resources (MENR) was established in 1963, and was responsible for Turkey’s energy policy. This was followed in 1970 by the creation of Turkish Electricity Administration (TEK), which would have a monopoly in the Turkish electricity sector at almost all stages apart from distribution, which were left to the local administrations.[8]

In the early 1980s, as was the case in many European countries, the Turkish electricity industry was dominated by a state-owned vertically integrated company, TEK. Starting from the 1980s, the government sought to attract private participation into the industry in order to ease the investment burden on the general budget. In 1982, the monopoly of public sector on generation was abolished and the private sector was allowed to build power plants and sell their electricity to TEK. In 1984, TEK was restructured and gained the status of state-owned enterprise.

Various private sector participation models short of privatization were put into practice. The first law setting up a framework for private participation in electricity industry was enacted in 1984 (Law No. 3096). This Law forms the legal basis for private participation through Build Operate and Transfer (BOT) contracts for new generation facilities, Transfer of Operating Rights (TOOR) contracts for existing generation and distribution assets, and the autoproducer system for companies to produce their own electricity. Under a BOT concession, a private company would build and operate a plant for up to 99 years (subsequently reduced to 49 years) and then transfer it to the state at no cost. Under a TOOR, the private enterprise would operate (and rehabilitate where necessary) an existing government-owned facility through a lease-type arrangement [7].

In 1993, TEK was incorporated into privatization plan and split into two separate state-owned enterprises, namely Turkish Electricity Generation Transmission Co. (TEAS) and Turkish Electricity Distribution Co. (*TEDAS*). However, the Constitutional Court of Turkey issued a series of rulings in 1994 and 1995 making the privatization almost impossible to implement in electricity industry. Therefore, in August 1999, the parliament passed a constitutional amendment permitting the privatization of public utility services and allowing international arbitration for resolving disputes. However, during this interval, Turkey not only lost five invaluable years in terms of reform process that could never get back but also, and more importantly, tried to enhance the attractiveness of BOT projects by providing ‘‘take or pay’’ guarantees by the Undersecretariat of Treasury for adding new generation capacity to meet anticipated demand. An additional law, namely the Build Operate and Own[9] (BOO) Law (No. 4283), for private sector participation in the construction and operation of new power plants was also enacted in 1997 again with guarantees provided by the Treasury.[10]

[8] In 1982, however, distribution was also transferred to TEK, thus making TEK a national vertically integrated monopoly fully owned by the state.

[9] Under the BOO model, investors retain ownership of the facility at the end of the contract period. That is, it is a kind of licensing system rather than a concession award.

[10] A typical BOT, BOO or TOOR generation contract, signed between the private party and TEAS or TEDAS, includes exclusive ‘‘take or pay’’ obligations with fixed quantities (in general, 85% of the plant output) and prices (or price formulas) over 15–30 years. That is, under these models, the government retains most commercial risks while providing the private sector with substantial rewards. Also the situation was worse in Turkey as, in Turkish case; there was no requirement for prequalification or even for a competitive open tender to conclude these contracts [7], which resulted in onerous terms and high electricity prices.

3.2. Recent electricity market reforms

By the end of the 1990s, it became clear that quasi-privatization with Treasury guarantees was not going to be feasible given the rapidly deteriorating fiscal situation. Therefore, Turkey turned to a *radically* different framework for the design of her energy market.

On 3 March 2001, Electricity Market Law (EML, No. 4628) came into force and aimed at establishing a financially strong, stable, transparent and competitive electricity market. In line with new law, TEAS was restructured to form three new state-owned public enterprises, namely Turkish Electricity Transmission Co. (TEIAS), Electricity Generation Co. (EUAS) and Turkish Electricity Trading and Contracting Co. (TETAS). The new law also created an autonomous regulatory body, namely Energy Market Regulatory Authority (EMRA).

Electricity Market Law[11] (EML) made former laws on private investment in the electricity sector obsolete. The main issues and building blocks of the new system are given below.

3.2.1. Market opening and market design

As of January 2008, on the demand side, consumers that consume more than 1.2 GWh per annum are designated as ‘‘eligible consumers’’ that are free to choose their suppliers. The ultimate aim is stated as 100% market opening. On the supply side, the authorization-type licensing framework was established in the new regime, which provides entry opportunities into generation, wholesale supply, distribution, retail supply, import and export of electricity. Transmission remains as a state monopoly.

At the heart of the new regime is a bilateral contracts market where generation companies contract with wholesale trade companies (TETAS and any eventual new entrants), distribution companies, any new independent retail supply companies, and eligible consumers. As for end-users, eligible consumers may not only buy electricity from their regional distribution/retail supply company, but also may buy directly from a wholesale company, a new independent retail supply company or an independent generator. Captive (or non-eligible) consumers, on the other hand, must buy their electricity from the distribution/retail supply company in their region, but they also have the right to buy from any retail supply company operating in the region.

The EML requires the regulated third party access (rTPA) regime for access to the transmission and distribution system. The regulatory body (the EMRA) will carry out the function of dispute settlement between parties.

As for public service obligations, the EML only allows for an explicit cash subsidy in the form of direct cash refunds to consumers without affecting the price structure in cases where some consumers need to be supported based on non-economic objectives.

The current market design does not envisage a centralized pool or power exchange. The actual real-time equality of demand and supply, given the bilateral contracts, will be carried out by the system operator (that is, TEIAS) through purchases and sales in a balancing market. For this purpose, a ‘‘System Balancing and Settlement Center’’ was established within TEIAS. In short, it is expected that the market would be mostly by bilateral contracts and pool would be limited to balancing transactions only.

3.2.2. Restructuring (or unbundling)

As discussed above, TEAS has been further unbundled into EUAS (generation), TETAS (wholesale trading and contracting) and TEIAS (transmission), each organized as a separate legal entity.

[11] EML is, for the most part, compatible with the EU Electricity Directive of 2003.

Under the new structure, EUAS will take over existing public power plants that are not transferred to the private sector. TETAS is created to carry out wholesale operations and it seems that it will dominate wholesale market in the near future. TETAS is also the holder of all previous BOO, BOT and TOOR contracts, including long-term power purchase agreements with Treasury guaranties; and will assume other stranded costs. TEIAS is responsible for transmission and, critically, for the balancing and settlement procedure that will balance the power transactions among parties, both physically and financially, in the new framework. That is, TEIAS is the transmission system operator (TSO) in Turkey.

Turkey's electricity distribution network was divided into 21 distribution regions. TEDAS, which owns 20 of the 21 regions, have been included in the privatization programme, and a separate distribution company has been established in each of these 20 regions. These distribution companies are currently owned by TEDAS.

3.2.3. Privatization

The principal aims of EML have been to open the Turkish electricity market to competition and found an independent regulatory agency to regulate the industry. The law does not particularly stress privatization, even though it outlines general principles of privatizations (Article 14[12]). EML's aim was to provide a way to a sustainable privatization by establishing a competitive environment.

In March 2004, the government issued the Strategy Paper Concerning Electricity Market Reform and Privatization, which outlines the major steps to be taken during the period up to 2012 and addresses various issues, including the privatization of *distribution assets* and power plants. According to the Strategy Paper, privatization will start in the distribution sector in 2005 and will be completed in 2006! After the privatization of distribution assets, generation privatization will start in mid-2006. Seventeen hydropower plants (which total 7055 MW of capacity[13]), the transmission system and market operator, TEIAS, will remain in state-ownership ([8], p. 144).

3.3. Legal environment regarding privatization of distribution regions[14]

In Turkish administrative law, the Constitutional Court and the Danistay (Council of State) recognize all segments of the electricity industry as public services, requiring close supervision by public authorities. Turkish public law deems contracts for the provision of public services by private parties to be administrative contracts. Accordingly, such contracts are subject to public law.

Turkish Parliament passed a constitutional revision on August 13, 1999 to open the door to privatization in the electricity industry. To begin with, the amendment gave Parliament the authority to allow for the provision of public services through private law contracts. The amendment also allowed international arbitration in concession contracts, which was denied previously by the Constitutional Court and the Danistay.

Turkish Constitutional Court describes privatization as the transfer of public rights, monetary and non-monetary assets to domestic and foreign private entrepreneurs. In recent decisions, the court argued that 'unlimited' foreign ownership in strategic industries such as telecommunications and electricity would weaken national security and run contrary to the notion of sovereignty. Restrictions on foreign ownership were thus seen as a constitutional requirement. The decision provides a major rule for privatization. Since unlimited foreign ownership of energy and telecommunications industries undermines national sovereignty, any acceptable privatization should include reasonable checks and limits against foreign ownership.[15]

Turkish Constitutional Court makes a distinction between privatizations in generation and that of electricity distribution. The Court accepts that operating rights for generation facilities can be transferred to private enterprises for a limited time. However, natural resources cannot be privately owned. Constitutional Court does not deny the ability to transfer ownership rights of a public company to private entrepreneurs in the case of electricity generation. In the text of the decision, the Court does not separate the ownership of the natural resource and any plant that uses the resource. In the case of distribution facilities, the Court permits TOR model. However, it does not mention the transfer of ownership rights of a distribution facility to private entrepreneurs. The Danistay has the same opinion on this issue. It seems that there is no constitutional restriction here.

The Constitutional Court and the Danistay take the public interest as the decisive criterion in their investigations on privatization cases; however, they cite the vague concept of public interest without giving a clear definition of what is in the public's interest. The reluctance to define public interest explicitly and precisely leaves plenty of room for political and legal maneuvering. Actually, this is one of the reasons why we do not find any clear description of public interest. The controversial nature of the notion of 'public interest' and varying interpretations of the concept by the political authority and judiciary has led to the annulment by the Constitutional Court and the Danistay of many privatization attempts in recent years. The resultant uncertainty about the outcome of privatizations, naturally, has increased the cost of privatization and served to discourage potential investors.

To come to the point, today, there are two regulations on electricity distribution privatizations. The older of the two provides the framework for the transfer of operation rights, enacted in 1984 (Law 3096, known as the "BOT Law"). The Cabinet has the authority to decide on privatization and MENR oversees the process. No transfer of ownership can be made through this process. The newer regulation is Article 14 of EML. However, this article does not provide the rules and methods of privatizations and refers to the general law on privatizations (Law 4046), mentioning only that MENR should provide proposals and/or opinions for a prospective electricity services privatization and also that foreigners cannot have controlling market power. Law 4046 provides the rules and regulations for any privatization in Turkey. The Privatization Administration (PA), established under this law as an administrative agency, implements and regulates privatizations. It undertakes the management of companies in the process of privatization. The law also describes methods of privatization, gives authority to the PA to determine the value

[12] Article 14 of this law is as follows: 'The Ministry shall provide the Privatization Administration with proposals and opinions regarding the privatization of the assets belonging to TEDAS and EUAS, their subsidiaries, affiliates, partnerships and operational units and facilities. The privatization process shall be executed by the Privatization Administration according to the provisions of Privatization Law no: 4046. The foreign real persons and legal entities engaged in the market activities as defined by this Law within the scope of privatization activities cannot have a market share that will enable them with a control power in the electricity generation, transmission and distribution sectors.'

[13] This figure equals to 19.5% of total installed capacity in Turkey.

[14] Unless otherwise stated, this part is mainly based on the information included in Ulusoy et al. [11].

[15] This concern of Turkish Constitutional Court is 'partly' alleviated by Article 14 of the EML. According to this article, foreign real persons and legal entities cannot have a market share that will give them controlling power in the electricity generation, transmission and distribution sectors.

of the company, and the authority to oversee the process of privatization.

3.4. TEDAS privatization overview[16]

Turkish Privatization Administration (PA) has started the privatization of Turkey's electricity distribution utility, TEDAS. PA has decided to start the privatization process with the simultaneous tender of three companies, each operating in respective regions, namely Ankara (BEDAS), Anatolian part of Istanbul (AYEDAS) and Sakarya (SEDAS).

3.4.1. The model

Privatization of distribution companies will be executed using a Transfer of Operating Rights (TOOR) backed Share Sale model (TSS model). According to this model, the investor will be the sole owner of the shares of the distribution company which will be the unique licensee for the distribution of electricity in the designated region but which will not have the ownership of distribution network assets and other items that are essential for the operation of distribution assets. The ownership of these distribution assets will remain with TEDAS. The investor, through its shares in the distribution company, however, will be granted the right to operate the distribution assets pursuant to a Transfer of Operating Rights Agreement (TOOR Agreement) with TEDAS.

Under the envisaged market structure, privatized electricity distribution companies will operate as regional monopolies with distribution licenses granted by EMRA. As part of ongoing liberalization efforts in the energy sector, Turkey's distribution network was divided into 21 distribution regions based on geographical proximity, managerial structure, energy demand and other technical/financial factors. After the inclusion of TEDAS in the privatization programme, a separate distribution company was established by the PA in each one of the 20 distribution regions owned by TEDAS. The only distribution region operated by a partially private company is Kayseri.

The aim of the TSS model is to handover a fully operating distribution company to the investor. Establishment of the distribution company as a separate legal entity, signing of the TOR Agreement, provision of distribution and retail sales licenses and signing of the Energy Sales Agreements have been defined as the necessary pre-requisites for the TSS model implementation. All of these steps have already been completed prior to the privatization tender announcement.

In the TSS model, the ownership of the existing assets and the new assets arising from investments to be carried out by the investor rests with TEDAS. The investor shall purchase the shares of a company which holds the operating rights of distribution assets and all related assets (e.g., buildings, vehicles, machine park), and the electricity distribution and retail licenses in a given region. All investments shall be realized by the investor and will be recovered through the tariffs. Except for cases of investor misconduct, the part of investments not yet recovered via the tariffs shall be paid by TEDAS to the investor upon the expiry or termination of the contract.

3.4.2. Tariffs

The main purpose of the market liberalization is to achieve lower tariffs by increasing overall system efficiency. Accordingly, the tariffs are calculated as "cost-reflective" based on predetermined operating and loss/theft improvement targets.

The first tariff implementation period (or transition period), set as five years from 2006 to 2010, will serve as the transitory period to a fully cost-based tariff structure after 2010. EMRA has already approved the end-user tariffs and revenue requirements of each distribution company for the transition period. Revenue requirements cover the projected expenses for providing distribution and retail services and provide an allowance for the target level of technical and non-technical losses. The end-user tariffs for the period after 2010 will be determined by the distribution companies in accordance with the Electricity Market Tariffs Communiqué and the related regulations and will be subject to EMRA's approval.

The first implementation period is designed to have a smooth and gradual transition from existing tariff structure to a lean and simple tariff structure. As of 2010, most customer groups will have cost-based tariffs in place and the tariff groups will be simplified to five only, namely residential, industrial, commercial, agricultural irrigation and lightening.

According to the Electricity Market Law, the Electricity Market Tariffs Communiqué and other related regulation, the four tariff components: (a) retail sales; (b) distribution; (c) retail services; and (d) transmission; are governed in an unbundled fashion. Retail sales tariff has a "price cap" which is set as the basket price of the energy purchased by the distribution company. Distribution and retail services have "revenue caps" which cover operating expenses and investment requirements related to distribution and retail services. Transmission tariff is a complete pass-through of transmission costs as charged by the national transmission company.

The existing "national tariff" scheme will be maintained for the first tariff implementation period, rather than implementing "regional tariffs" so that sudden price fluctuations could be avoided (currently, regional cost-based tariffs vary significantly due to wide variation of loss/theft levels and other parameters across the regions). Implementation of national tariffs, however, will result in revenue imbalances since the distribution company revenues will differ from their envisaged revenue caps. In order to remove such imbalances, EMRA will put in place a tariff equalization scheme to transfer revenues across the regions.

While the overall tariffs are pre-determined and approved for 2006–2010, the tariff revision process has still not been finalized. The exact nature and details of the process are expected to be announced by the EMRA soon.

3.4.3. Investments

One of the primary objectives of privatization is to finance required distribution system and network improvements and expansions through private sector investments, thereby removing the burden of such investments away from the state budget. Investments are of great importance in ensuring continuity and quality of service in electricity distribution.

The annual expansion, replacement and improvement investments that are required in each of the 20 distribution regions during the first tariff implementation period (2006–2010) have been determined during the preparation of the end-user tariffs. For TEDAS as a whole, the investment requirement for the transition period is a total of YTL 2.8 billion ($2.3 billion), distributed equally to each year of the transition period. These investments have been embedded into the first implementation period tariffs approved by EMRA; hence, they will be recouped by the distribution companies over time. Investment requirements could be updated by EMRA through the revision mechanisms.

After 2010, distribution companies will prepare annual investment plans each year by making projections on consumption growth, analyzing network expansion requirements and other technical parameters. They will then present these investment plans to EMRA for approval. After receiving EMRA approval,

[16] Unless otherwise stated, this part is mainly based on the information included in Lazard [1].

distribution companies are obliged to implement the approved plans. Implementation of these investments (i.e. investment amount and form) will be monitored through investment control and quality measurement mechanisms set up by EMRA in collaboration with the distribution companies.

EMRA approved tariffs do incorporate an allowed level of regulated return on the investments and services to be carried out as part of the electricity sales and distribution activities. In addition to this allowed level of return, the distribution company can create substantial value by beating the pre-approved loss/theft and operational efficiency targets.

3.4.4. The progress so far

On January 9, 2007, the Turkish government announced the postponement of the privatization of parts of the country's electricity distribution network amid fears that it would lead to higher prices for consumers in a general election year. During a trip abroad, the prime minister unsettled some of his cabinet colleagues and the financial markets by suggesting that the sell-off might be too politically sensitive as Turkey nears polls, scheduled for November 2007.

On July 1, 2008, the Turkish Privatization Administration put out two distribution regions to tender. Turkey's Sabanci Holding (Enerjisa) and Austrian power giant Verbund submitted the highest bid in the first tender for Baskent Electricity Distribution Corporation (BEDAS) with an offer of $1.225 billion. In the second separate tender, Akcez consortium offered highest bid for Sakarya Electricity Distribution Corporation (SEDAS) with $600 million.

The consortium of Verbund and Sabanci would pay $1.225 billion for 100% stakes of Baskent, which supplies 10 TWh of electricity to 2.9 million customers in and around the Turkish capital of Ankara. In the second tender, Akcez consortium offered the highest bid for the bargaining for the block sale of Sakarya Electricity Distribution Corporation with $600 million. The Ankara and Sakarya grids together have 4.2 million customers who consume a combined 18 million gigawatt-hours of electricity.

Turkey's first auction of power grids attracted just two foreign utilities firms, compared with at least eight that planned to participate in 2006, as the increased political uncertainty in Turkey added to the deteriorating global financial conditions.

Recently, the government also raised the price of electricity for residential use by 22%, and the price of electricity for industrial use by 21 recently. The price hikes, part of an overhaul of Turkey's electricity pricing mechanism, is seen as an important step for the privatizations of electricity distribution and production assets.

Next up for sale are power grids covering the central Anatolian region of Meram, and Aras in the east.

4. Why should the distribution be privatized?

The growing empirical evidence on the inefficiency of state-owned enterprises and a worldwide trend toward liberalization are the main motivations of privatization in many developing countries. Turkish public enterprises in general and Turkish public electricity distribution companies in particular have not been the exceptions.

The balance between state and market experienced a radical shift with the fall of the Berlin wall in 1989. Since then, the boundaries of the state have started to shift; and the privatizations in Britain and the transition from state socialism to the market economy in Eastern Europe accelerated this shift. Within less then a decade, privatization spread around the world. Today, the English model of vertical separation succeeded by privatization and regulation is rapidly becoming the reference model for reform in both developed and developing countries.

Electricity is a product that is generally regarded as nonstorable.[17] Also, the demand for electricity fluctuates by time of day and year, as the weather varies, and randomly. Supply is also subject to unpredictable outages. However, the equilibrium between supply and demand, called "electrical equilibrium", must be maintained continuously and throughout the system, which calls for extremely close minute-by-minute coordination between generation and transmission & distribution.

In view of technical characteristics of the industry, a policy of vertically integrated monopoly has some attractions. The integrated generation/transmission/distribution company can easily run its power stations that meet demand at minimum cost at each point in time. Moreover, in the longer run, investment can be planned to give the optimal mix and capacity to meet prospective demand with reasonable security of supply. This is, actually, the main reason why these activities have historically been vertically integrated. Nevertheless, since they allow no room for competition and its associated incentives, such schemes nowadays have started to be replaced by vertically separated private utilities with the aim of fostering competition.

In economic theory, the reasons for privatization are manifold. The ultimate and most important aim of privatization is ensuring "economic efficiency"; and it can be realized in full sense only by effective competition, which requires reducing the role of government in economic life as a whole. The case for private ownership rests essentially on the importance of incentives to innovate and to reduce costs. The weak incentive of government employees concerning both cost reduction and innovation is the basic reason of superiority of private ownership. In a state-owned company, prices do not reflect costs; and costs themselves are usually inflated through excessive employment and excessively expensive capital; incentives to innovate are reduced to minimum (or in worst cases to zero); quality of service is lower than in a competitive environment; and the number of choices available to consumers is extremely limited (or even reduced to one!). What is more striking and dangerous is that until the point when it is seen to be in crisis from outside, a public enterprise never feels a failure no matter what is the degree of its failure in realizing economic efficiency.

The other reasons for privatization cited in the literature may be summarized as follows. Privatization provides competition with a fertile ground to develop. Also, it is argued that the valuation of the company by movements in its share price in stock exchanges is potentially an important check on a privatized enterprise's performance. Moreover, the possibility of a hostile takeover in a competitive market imposes a fierce discipline on the management and provides a powerful incentive to good management because a takeover usually leads to many changes near the top. Furthermore, some scholars claim that the most important effect of privatization is that the changes it brings about become practically irreversible. In the case of reforming public enterprises, the possibility is much greater that a change of government or even just a change in the opinion of the same government will undermine all reforms and may result in a return to the old interventionism and confusion. Privatization, on the other hand is less reversible not only because the legislation needed to reverse it would be more complex, and because in some cases the privatized bodies have disappeared into other firms or acquired overseas ownership, but also because too

[17] Armstrong et al. ([14], p. 280) reports that there is a sense in which some hydroelectric power can be stored. In the UK, the National Grid Company has a pumped storage business in the Welsh mountains. Water pumped uphill at night can produce hydroelectric power the following day, thereby effectively storing some night-time electricity. This is economically efficient, provided that the day/night electricity price ratio is high enough.

many interests have been created that are opposed to renationalization [9].

In Turkish case, the officially declared reasons for the privatization of electricity distribution regions are as follows [10]:

- ○ Efficiency improvement and cost reduction
- ○ Ensuring security of electricity supply and improvement in quality of electricity supplied
- ○ Reduction in distribution loss/theft levels
- ○ Getting private sector made necessary investments in electricity distribution business
- ○ Exploiting the benefits of competition and directing those benefits to consumers

5. Guidelines for policy makers

Having discussed both the background and current status of developments in Turkish electricity distribution segment let me comment on them. On the positive side and from the investors' point of view, the benefits and opportunities of the envisaged system can been summarized as follows. First of all, the investor is allowed to retain excess value derived from outperforming the predetermined loss/theft targets approved by EMRA. Accordingly, as a result of this policy, technical and non-technical losses, which have become an excessive financial burden in Turkey over the years, are expected to be reduced to single digit figures. Also, the investor is allowed to retain the savings achieved if energy is sourced at a lower wholesale cost than the regulated reference price. This policy will pave the way for construction of low-cost electricity production facilities going forward. Furthermore, the investor is allowed to retain excess value derived from outperforming the predetermined operational improvement targets approved by EMRA. This will trigger efficiency improvements in electricity distribution. At each distribution company, substantial operational efficiency improvements are believed to be achievable through optimizing core business processes such as billing and collections, arranging and redesigning work flows, enabling effective coordination between divisions, improving information systems and infrastructure and optimizing personnel productivity [1].

Within this context, the efficiency improvements in distribution segment is especially crucial since distribution cost together with generation cost make up more than 75% of electricity bill of a household in Turkey, which means that any efficiency increase in distribution industry may be redirected to reductions in electricity bills. Table 4 provides the distribution of costs in electricity bill of a household in Turkey.

Table 4
The distribution of costs in electricity bill of a household in Turkey (2008)

	YTL/kWh	%
Generation (*a*)	0.121069	64.07
Transmission (*b*)	0.004152	2.20
Distribution (*c*)	0.021417	11.33
Retail sale (*d*)	0.001639	0.87
Total ($A = a + b + c + d$)	0.148277	78.47
Energy fund (1%) (*e*)	0.001483	0.78
TRT share (2%) (*f*)	0.002966	1.57
Municipality consumption tax (5%) (*g*)	0.007414	3.92
Total ($B = e + f + g$)	0.011862	6.28
VAT (18%) ($C = [A + B] \times 0.18$)	0.028825	15.25
Total ($A + B + C$)	0.188964	100.00

On the negative side, there exist some crucial problems that must be addressed to establish a healthy system of electricity distribution. First of all, as indicated, the main components of electricity price can be divided into the wholesale price, the price of network operations (transmission & distribution) and taxes. Since wholesale price, tax related issues and the price of transmission network operations are outside the scope of the present paper, let me concentrate on the price of distribution network operations. We know that even tax level, wholesale price and the price of transmission network operations are determined efficiently, total welfare can be significantly disturbed if distribution network operations are priced inefficiently. In literature, it is argued that if a sector presents natural monopoly characteristics (i.e., real competition is not possible), the only two reasonable ways to determine the price of distribution network operations are benchmarking and frequent tenders. However, in Turkey, the current model seems to be based on a kind of rate of return regulation, in which costs are determined by the regulated firm and the regulator approves them before their reflection into tariffs. Since, the regulator cannot determine the optimal level of costs due to the problem of asymmetric information; such a system is far from ensuring economic efficiency. Therefore, a kind of benchmarking or frequent tenders should be incorporated in tariff determination process in Turkey.[18]

Second, the current situation of continued state-ownership of the distribution companies limits the supervisory role of EMRA over the market. The lack of necessary incentive mechanisms for managers and bureaucrats in the distribution companies makes regulatory enforcement more difficult and leaves room for political pressure in the industry. Therefore, the privatization of distribution companies must be completed as soon as possible in an appropriate way. The opposition to privatization of some bureaucrats will definitely be formidable. To counter this, a chairman who is more favorable to privatization may be appointed to the enterprises to be privatized.[19]

Third, it seems that current model of privatization (TOOR) is preferred in electricity distribution to prevent a situation of double payment by end-users. Since infrastructure costs have already been recouped by the state – more precisely, by taxpayers – prior to privatization, if the distribution assets are sold, then the purchasing company would reflect such asset costs to the tariffs and customers will be made to pay twice for the same cost. Although it is a reasonable approach, the use of the TOR model as the method of privatization creates its own problems. For instance, it seems that in the tenders for distribution regions the competing firms will bid based on the shares of the distribution company which will be the unique licensee for the distribution of electricity in the designated region. However, such a method is far from realizing irreversibility of the privatization process as it is very easy to return back to previous structure since ownership of the assets are not transferred to private parties. Actually, from an economic point of view, a method based on the transfer of asset ownership to private parties and a tender based on "unit service and depreciation charge" are much more preferable to current practices.

The fourth concern is related with ambiguity of the process following tenders. That is, how long will a firm be a unique licensee

[18] For a more in depth discussion of the subject in general and "problem of asymmetric information" in particular, see Erdogdu [15].

[19] Another important problem is the unions' reaction to privatizations. There is much at stake and unions are expected to take all legal and political measures to stop privatizations until their demands are satisfied. In fact, they have challenged privatizations in court in almost all recent privatizations. In many cases, privatizations were cancelled based on legal technicalities. Unions also lobby the government in order to get better pecuniary gains for their displaced members.

for the distribution of electricity in the designated region? If an incumbent distribution company prefers to put an end to its activities, what will happen? Will there be another tender? If yes, will new firm pay to previous firm for the shares? In the literature, it is stated that repeating tenders on a specific basis is urgent if benchmarking is not employed in the tariff determination process because it remains the only way to reflect the cost reductions to consumers. If both benchmarking and frequent tenders are not employed, then the incumbent firm gets all benefits of cost reduction without reflecting them to tariffs. In Turkey, both of these methods are not planned to be employed so there exists a threat of excessive profits in the sector.

Other three concerns relate to "expertise", "effective regulation" and "institutionalization". To begin with, all persons or bodies that do not have sufficient expertise in issues related with energy markets but whose ideas or decisions have still a vital effect on the energy market should consult those with expertise before revealing their ideas or making some decisions with an (sometimes, profound) effect on the energy market. The decisions of courts are especially critical in this respect. Also, effective regulation by EMRA is extremely imperative to set up a fully functioning market. Therefore, EMRA needs to be prepared for such a regulatory function by equipping itself with necessary tools, such as highly qualified staff, necessary technological infrastructure and so on. The last issue is the institutionalization of the whole process of market reform, including privatization, tariff setting, etc. As we know that the expressed intent toward privatization and liberalization do not always mesh with political preferences. While politicians have long-term desires to privatize state-owned enterprises (like, TEDAS), their short-term goals and bureaucratic stronghold cause them to remain tied to the reigns of economic power and potential rent sources. Without institutionalization, Turkish electricity distribution sector will not be able to get rid of the dump of unimplemented plans and timetables, such as the Strategy Paper of March 2004; will continue to be directed by sudden and unexpected unilateral acts of politicians, as in the case of previous postponement of tenders by prime minister in January 2007; and rent seeking activities in overextended public institutions will continue to harm by encouraging economic inefficiencies, thus causing welfare losses and wealth transfers due to higher electricity prices.

Finally, at first sight, auction model appears to provide a very attractive way of combining competition and efficiency without any heavy burden for the regulator. The competition for market appears to destroy the undesirable monopoly of information that hinders conventional regulation, and price is set by competition, not by bureaucrats. Provided bidding is competitive, an auction will reduce the profits to the normal competitive level by inducing bid prices equal to unit costs of production.

Nevertheless, auction model is not without some difficulties. First of all, as mentioned above, bidding must be competitive and cases of collusive bidding need to be prevented. There exist mainly two reasons why bidding might fail to be competitive. First of all, there is a danger of collusion between bidders, especially if they are few in number,[20] or if the firms are effectively in a repeated interaction (or, "game") with one another via frequent contracts. The second reason is that one firm might enjoy such strategic advantages in the competition for the franchise that other firms would be unwilling to compete with it. For instance, suppose that an incumbent firm is the holder of a franchise that is now up for renewal. Since, thanks to its past operation of the franchise, the incumbent has already reduced its costs; other firms will be unwilling to compete with the incumbent as they know that they are unlikely to win the competition. Also, another source of incumbent advantage may originate from asymmetries of information. The incumbent's knowledge of cost and demand conditions is likely superior to that of any other firm, which tends to deter others from competing with it in the future auction.

The merits of auction model are further reduced by the issues related with asset handover. Unless sunk costs are zero (an extremely unlikely event), efficiency requires that the new operator of the franchise takes over the assets from the incumbent.[21] Therefore, one needs to decide how the assets to be valued for this purpose. In such a case, there is a problem of bilateral monopoly. If incumbent has no alternative, it has to accept as little as the scrap value of the assets. If the new operator firm has no alternative, it has to pay as much as their replacement value. The gap between replacement value and scrap value is likely to be large if the assets involve sunk costs.

The last difficulty with auction model is the question of specification, administration and monitoring of franchise contract. The duration of franchise contract must also be considered. The difficulties of contract specification and administration perhaps suggest that short-term contracts have advantages, because fewer future unforeseeable events then need to be considered. Nevertheless, the organization of frequent contests for the franchise also involves major costs: all the problems of asset valuation and handover occur more often, and the industry would frequently be in a state of turmoil.

6. Conclusion

Although Turkish electricity reform has not concluded yet, we can assess its performance to date in achieving its primary goals. The reform is quite complex and addresses different objectives. The main one is to change the government to policy-maker and regulator, transferring the responsibility of operations and investment to the private sector. This change was imposed by its unwillingness and incapacity to finance system expansion and by the urgent necessity of attracting private investment, which is crucial to avoid an electricity supply collapse. That is, the privatization of the Turkish electricity distribution sector is not a social option; it is mandated by economic constraints, since the government does not have the capacity to invest and guarantee electricity supply to support economic growth.

In this paper, we have tried to present current situation of Turkish electricity distribution privatizations and summarize some problems that surround them. The paper is for the most part limited to the economic dimension of the problems and their practical implications. The privatization experience in the Turkish electricity distribution segment is of considerable interest for observing how globalization via international investment in the privatization of an emerging country's strategic sector deals with local patriotic reactions arising from various national entities, including the national judiciary and bureaucratic establishment [11].

Despite relatively good legislative framework, the current Turkish policy on privatization of distribution regions in practice seems to be far from ideal. The whole privatization process appears to aim providing additional revenues to Treasury without paying attention to the crucial underlying economic logic. It should not be forgotten that every new structure entails new understanding of the issues. If privatization process progresses based on underlying economic logic, there is no reason not to believe that the domestic and foreign investors will be greatly interested in entering a

[20] Since, in electricity distribution industry, the requisite skills and/or resources are rare; it is generally the case.

[21] Otherwise there will be inefficient duplication of assets.

market with excellent growth potential, like Turkish electricity distribution business. Also, one should not blame the bureaucrats in the Turkish energy industry, its unions, and others for trying to protect what they see as their interests by persuading the government to retain previous structure as much as possible. But it will have a devastating effect for the country if they are successful in doing so as the way would be open for continued manipulation of state-owned electricity distribution companies.

In a few words, Turkey is at a crossroads and she needs to answer the question of whether the operation and management of electricity distribution networks in this country will evolve into a market-driven commodity business or remain a genuine public utility task. As only a limited number of actions have been taken in the privatization process so far, a significant amount of work still lies ahead to answer that question.

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